

**WHAT IS CLAIMED IS:**

1. A method for developing a program which is to be installed in a system having an LSI device, the LSI device having a secure memory which includes an unrewritable area, the

5 method comprising the steps of:

providing an LSI device having the same structure as that of the LSI device;

setting the provided LSI device to a development mode so that the provided LSI device is used as a development LSI device, the development mode being different from a product operation mode employed at the times of program installation and product

10 operation; and

developing the program on the development LSI device.

2. The method of claim 1, wherein the operation of the LSI device is restricted such that when being set to the development mode, the LSI device can execute a raw (binary)

15 program, and when being set to the product operation mode, the LSI device cannot execute a raw (binary) program.

3. The method of claim 1, further comprising the step of encrypting the program developed on the development LSI device at the program development step.

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4. The method of claim 1, wherein the operation of the LSI device is restricted such that when being set to the development mode, the LSI device cannot generate a key for encrypting a raw (binary) program.

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5. The method of claim 1, further comprising the steps of:

providing an LSI device having the same structure as that of the LSI device;  
setting the provided LSI device to a key-generation mode so that the  
provided LSI device is used as an key-generation LSI device, the key-generation mode  
5 being different from the development mode and the product operation mode; and  
installing an encrypted key-generation program in the key-generation LSI  
device and executing the key-generation program to generate a key.

6. The method of claim 5, wherein the operation of the LSI device is restricted such that  
10 when being set to the key-generation mode, the LSI device cannot execute a raw (binary)  
program.

7. The method of claim 5, further comprising the steps of:

providing an LSI device having the same structure as that of the LSI device;  
15 setting the provided LSI device to an administrator mode so that the  
provided LSI device is used as an administrator LSI device, the administrator mode being  
different from the development mode, the product operation mode, and the key-generation  
mode; and  
developing the key-generation program and encrypting the developed key-  
20 generation program with any key on the administrator LSI device.

8. A program development supporting system for supporting development of an encrypted  
program, comprising:

an LSI device having the same structure as that of an LSI device on which  
25 the encrypted program runs; and

an external memory for storing a raw (binary) program, wherein  
the LSI device includes a secure memory for storing common key  
information regarding a raw common key, and  
the LSI device is capable of executing

5 a first step of obtaining the raw common key from the common key  
information stored in the secure memory, and

a second step of encrypting the raw (binary) program input from the  
external memory using the raw common key.

10 9. The program development supporting system of claim 8, wherein:

the common key information includes an encrypted common key which is  
obtained by encrypting the raw common key with a raw first intermediate key and an  
encrypted first intermediate key which is obtained by encrypting the raw first intermediate  
key with a second intermediate key; and

15 the first step includes the step of obtaining the raw common key using the  
encrypted common key, the encrypted first intermediate key and a program encryption  
seed.

10 A program development supporting system for supporting development of an  
20 encrypted program, comprising:

an LSI device; and

an external memory for storing a raw (binary) program, wherein

the LSI device includes

a secure memory for storing common key information regarding a  
25 raw common key, and

a boot ROM for storing a boot program, and  
by executing the boot program stored in the boot ROM, the LSI device  
executes

a first step of obtaining a raw common key from the common key  
5 information stored in the secure memory, and

a second step of encrypting the raw (binary) program input from the  
external memory using the raw common key.

11. The program development supporting system of claim 10, wherein:

10 the common key information includes an encrypted common key which is  
obtained by encrypting the raw common key with a raw first intermediate key and an  
encrypted first intermediate key which is obtained by encrypting the raw first intermediate  
key with a second intermediate key; and

the first step includes the step of obtaining the raw common key using the  
15 encrypted common key, the encrypted first intermediate key and a program encryption  
seed.

12. A method for installing an encrypted program in a key-implemented system which  
includes an external memory and an LSI device having a secure memory, the method  
20 comprising:

an initial value setting procedure for storing common key information  
regarding a raw common key and inherent key information regarding a raw inherent key in  
the secure memory;

a first step of obtaining in the LSI device the raw common key from the  
25 common key information stored in the secure memory;

a second step of decrypting in the LSI device a common key-encrypted program supplied from the external memory into a raw (binary) program using the raw common key obtained at the first step;

a third step of obtaining in the LSI device the raw inherent key from the  
5 inherent key information stored in the secure memory;

a fourth step of encrypting in the LSI device the raw (binary) program obtained at the second step using the raw inherent key obtained at the third step, thereby obtaining an inherent key-encrypted program; and

the step of installing the inherent key-encrypted program obtained at the  
10 fourth step in the external memory.

13. The method of claim 12, wherein

the LSI device includes a boot ROM for storing a boot program, and

the LSI device executes the boot program stored in the boot ROM, thereby  
15 executing the first to fourth steps.

14. The method of claim 12, wherein

the inherent key information is stored in an unrewritable area of the secure  
memory.

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15. The method of claim 12, wherein

the common key information includes an encrypted common key which is obtained by encrypting the raw common key with a raw first intermediate key and an encrypted first intermediate key which is obtained by encrypting the raw first intermediate  
25 key with a second intermediate key; and

the first step includes the step of obtaining the raw common key using the encrypted common key, the encrypted first intermediate key and a program encryption seed.

5 16. The method of claim 12, wherein:

the inherent key information includes an encrypted inherent key which is obtained by encrypting the raw inherent key with a raw first intermediate key and an encrypted first intermediate key which is obtained by encrypting the raw first intermediate key with a second intermediate key; and

10 the third step includes the step of obtaining the raw inherent key using the encrypted inherent key, the encrypted first intermediate key and a program encryption seed.

17. The method of claim 12, wherein the inherent key information is an inherent ID which  
15 is inherent to the LSI device.